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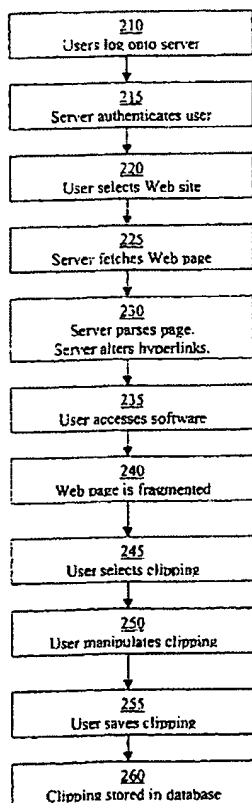
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(54) Title: **CLIPPING AND MANIPULATING ELEMENTS CONTAINED IN A WEB PAGE**



(57) Abstract: The invention provides an improved technique for clipping and manipulating the elements of a web page. Elements of a web page can be selected, moved to a personalized clipping page, and resized and manipulated in a variety of ways without affecting the integrity of the content, including the image and links contained therein. In a first aspect of the invention, a web page is fragmented into "clippings". Each clipping includes a portion of the page that can be manipulated. The relative size of a clipping is responsive to the structure of the web page and the judgement of the user. Once a clip is selected, the user can zoom-in and select smaller elements from the clipping. The structure of the web page determines the granularity of the clipping. In a second aspect of the invention, the user selects how to display the clipping. For example, the user may elect to apply a filter to change the size or relative proportions of the clipping. Unlike the related art which limits the user's options to placing information in a particular column, the user can change the size of the clipping (scaling it up or down), alter the orientation of a clipping, apply special effects to the clipping, transform the shape of a clipping and place the clipping anywhere in a page. In a third aspect of the invention, the user can apply one or more filters to a clipping or parts of a clipping so as to enhance the process of identifying areas that are of interest. For example, the user can apply a filter that causes all text including certain words, or phrases to become highlighted. Other variations are also possible. For example, a user can choose to retain the links included in a clipping and discard the rest. Similarly, the user can keep selected figures, specific lines of text or types of text and discard the rest. In a fourth aspect of the invention, the clipping remains fully interactive. Upperlinks to other parts of a web page or to other pages remain active, as do the applets embedded in a page. Similarly, features such as pull down menus and other interactive elements remain functional as long as the button that controls them is included in the clipping.

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CLIPPING AND MANIPULATING ELEMENTS CONTAINED IN A WEB PAGE

Background of the Invention5 1. *Field of the Invention*

This invention relates to the creation of web pages.

10 2. *Related Art*

One aspect of the Internet that has become popular is researching topics that are of interest to a user. Individual users can operate web client software to (1) access web sites containing information that is of interest to them and (2) uncover other and further web sites or web pages that have related information in a process
15 known as "surfing".

One problem in the known art of Internet surfing is that only a small portion of a web page may be of interest to a client. The user must review the entire page and scroll through relatively uninteresting material before accessing a particular
20 area of a page or a particular hyperlink that is of interest. It is not possible to isolate the area of interest from the rest of the web page that it is associated with.

A second problem in the known art is that it is not possible for a user to view information from two different pages simultaneously. The user must navigate
25 from one web server to another, from web page to another, often experiencing an undesired delay when transitioning from one site to another.

A third problem is that it is not possible for a viewer to view two different sections of a web page simultaneously. The user must scroll back and forth
30 between the between the two areas.

A limited solution to these problems has been provided by software that enables a user to generate "start pages" from parts of other web pages. While this solution allows a user to select personalized content for a start page, it remains very imperfect because the user has very little flexibility with respect to the presentation of content on the start page. Similarly, the viewer cannot choose whether to read the content or have it read to them, by an artificial voice.

Accordingly, it would be desirable to provide an improved technique for navigating or surfing the Internet. This is achieved in an embodiment of the invention in which a portion of a web page can be "clipped", moved, resized and repositioned in a manner that is responsive to the discretion of the user. Selected portions of a page can then be laid out next to each other or "on top of" each other so that they can be viewed simultaneously or sequentially.

The invention provides an enabling technology for manipulation of elements included in a web page, so as to obtain substantial advantages and capabilities that are novel and non-obvious in view of the known art. Examples described below relate to manipulation of data contained in web pages so as to facilitate review of these pages, but the invention is broadly applicable and can be used to "clip" and display any kind of information available on a network. In a preferred embodiment, the information is displayed on a web page generated by a user.

Summary of the Invention

The invention provides an improved technique for clipping and manipulating the elements of a web page. Elements of a web page can be selected, moved to a personalized clipping page, and resized and manipulated in a variety of ways without affecting the integrity of the content, including the image and links contained therein.

In a first aspect of the invention, a web page is fragmented into "clippings". Each clipping includes a portion of the page that can be manipulated. The relative size of a clipping is responsive to the structure of the web page and the judgment of the user. Once a clip is selected, the user can zoom-in and select smaller elements from the clipping. The structure of the web page determines the granularity of the clipping.

In a second aspect of the invention, the user selects how to display the clipping. For example, the user may elect to apply a filter to change the size or relative proportions of the clipping. Unlike the related art which limits the users' options to placing information in a particular column, the user can change the size of the clipping (scaling it up or down), alter the orientation of a clipping, apply special effects to the clipping, transform the shape of a clipping and place the clipping anywhere in a page.

In a third aspect of the invention, the user can apply one or more filters to a clipping or parts of a clipping so as to enhance the process of identifying areas that are of interest. For example, the user can apply a filter that causes all text including certain words, or phrases to become highlighted. Other variations are also possible. For example, a user can choose to retain the links included in a clipping and discard the rest. Similarly, the user can keep selected figures, specific lines of text or types of text and discard the rest.

In a fourth aspect of the invention, the clipping remains fully interactive. Hyperlinks to other parts of a web page or to other pages remain active, as do the applets embedded in a page. Similarly, features such as pull down menus and other interactive elements remain functional as long as the button that controls them is included in the clipping.

In a preferred embodiment, the software used to manipulate a web page is stored on a web server that is dedicated the manipulation and transfer of

information contained in web pages. The individual user can access the server to manipulate information contained in web pages or store a manipulated page or other information.

5 Brief Description of the Drawings

Figure 1 shows a block diagram of a system for clipping and manipulating elements contained in a web page.

10 Figure 2 shows a process flow diagram for a method of using a system for clipping and manipulating elements contained in a web page.

Figure 3 shows an example of a clipping page created from set of clippings.

15

Detailed Description of the Preferred Embodiment

In the following description, a preferred embodiment of the invention is described with regard to preferred process steps and data structures. Those skilled in
20 the art would recognize after perusal of this application that embodiments of the invention can be implemented using one or more general purpose processors or special purpose processors or other circuits adapted to particular process steps and data structures described herein, and that implementation of the process steps and data structures described herein would not require undue experimentation or further
25 invention.

Related Applications

Inventions described herein can be used in conjunction with inventions
30 described in the following application:

- International Application Serial No. PCT/US00/03970, filed on 11 November 2000 in the name of ezlogin.com (now Ezlogin.com, Inc.), titled "Personalized Access to Web Sites," and published on 17 August 2000 under publication no. WO 00/48110.

5

Lexicography

As used herein, use of the following terms refer or relate to aspects of the invention as described below.

10

- **clipping** – as used herein, the phrase "**clipping**" refers to any portion of a web page that can be isolated and manipulated. The phrase also refers to the technique of isolating and identifying a portion of a web page that is to be manipulated.

15

- **sizing** – as used herein, the phrase "**sizing**" refers to a technique for changing the size or proportions of clipping, a set of clippings, a portion of a clipping or other element included in a web page.

20

- **user** – as used herein, the phrase "**user**" includes any person who acts either on behalf of themselves or an entity and manipulates a client device in such a way so as to gain access to the Internet and add to, delete, resize, reposition or other manipulate a web page or portions thereof or who creates a clipping page by manipulating a web page.

25

- **web page** – as used herein, the phrase "**web page**" includes a display of information that can be accessed by visiting a web site. Such pages generally (but not necessarily) include one or more hyperlinks to other parts of the page or other pages. In a preferred embodiment, the web pages can be selected by a user from an index of web pages. In other embodiments, the user can select the web page without referring to the index.

30

- **clipping page** – as used herein, the phrase “**clipping page**” includes a web page upon which a user places clippings that he has selected or manipulated. In a preferred embodiment, the clippings placed on the “clipping page” include hyperlinks to sites of interest to the user, enabling the user to use it as a start page, or a place from which to begin navigating the Internet.
- **web site** – as used herein, the phrase “**web site**” includes any combination of devices or software taking on the role of a server in a client-server environment in the Internet, the world wide web, or an equivalent or extension thereof. There is no particular requirement that a web site must be an individual device. A web site can be a single device, a set of cooperating devices, a portion of a device, or some combination thereof. It also refers to a commercial, corporate or personal location, on the World Wide Web.
- **navigate** - as used herein, the phrase “**navigate**” includes activities whereby by a an individual user uses a web client to access information and move from one web site to another web site, one web page to another web page, within a web page, and onto and off of an internet, intranet or other network.
- **client and server** – in general, “**client**” and “**server**” refer to a relationship between two devices, particularly to their relationship as client and server, not necessarily to any particular physical devices.
- **client device and server device** - in general, the phrase “**client device**” includes any device taking on the role of a client in a client-server relationship (such as an HTTP web client and web server). There is no particular requirement that any client devices must be individual physical devices; they can each be a single device, a set of cooperating devices, a portion of a device, or some combination thereof. As used herein, the phrase “**server device**” includes any device taking on the role of a server in a client-server

relationship. There is no particular requirement that server devices must be individual physical devices; they can each be a single device, a set of cooperating devices, a portion of a device, or some combination thereof.

5 These descriptions of general meanings of these terms are not intended to be limiting, only illustrative. Other and further applications of the invention, including extensions of these terms and concepts, would be clear to those of ordinary skill on the art after perusing this application. These other and further applications are part of the scope and spirit of the invention, and would be clear to those of
10 ordinary skill in the art, without further invention or undue experimentation.

System Elements

15 Figure 1 shows a block diagram of a system for clipping and manipulating elements contained in a web page.

A system 100 includes at least one client device 110, a communication network 120, at least one web site 130 that displays a web page 135, a personal data
20 server 140 and a clipping page 150.

Each client device 110 includes an input element 111, a presentation element 112, a local memory 113, and software 114 disposed for communicating with the web site 140. Each client device 110 is under the control of a user 115 who
25 wishes to create a clipping page 150.

In a preferred embodiment, each client device 110 includes a general-purpose computer, such as a laptop or workstation. However, a client device 110 can also include (either alone or in conjunction with a laptop or workstation), a hand-held
30 calendar (such as a "Palm Pilot" or other hand-held device), a portable computer, a special purpose computer, a cellular telephone or other telephonic device, a web

server acting as the agent for a user, or other information appliance. In alternative embodiments, a client device 110 may also include any other device disposed for performing the all or some functions described herein.

5 The communication network 120 is disposed for communicating data between the client device 110 and the personal data server 140. In a preferred embodiment, the communication network 120 includes a packet switched network such as the Internet, as well as (in conjunction with or instead of) an intranet, an enterprise network, an extranet, a virtual private network or a virtual switched
10 network. In alternative embodiments, the communication network 120 may include any other set of communication links that couple the client device 110 and the personal data server 140.

 The web site 130 displays at least one web page 135. The user
15 navigates until they identify a web page 135 that they wish to manipulate.

 In a preferred embodiment, a user selects the web page 135 from an index (not shown) of web pages. However, regardless of source, the web page 135 includes at least one hyperlink 137 to another part of the web page 135, a different
20 web page 135 or a different web site 130.

 The personal data server 140 is similar to the client device 110 in that it also includes an input element 141, a presentation element 142 and a local memory 143. However, the personal data server 140 also includes web server software 144,
25 web page manipulation software 145, a database 146 and a software package 147.

 The web server software 144 allows the personal data server 140 to act on behalf of the user 115 with respect to accessing one or more web sites 130. The personal data server 140 acts on behalf of the user 115, getting one or more desired
30 web pages 135 for the user 115 and manipulating them in ways that are responsive to the user's directions. The personal data server 140 is disposed to deliver the web

pages 135 and clipping page 150 to at least one client device 110. The personal data server 140 can support several types of protocols, including HTTP and HTTPS.

Web page manipulation software 145 allows a user to manipulate the web pages 135 obtained by the web server software 144. In a preferred embodiment, the web page manipulation software 145 can fragment a web page 135 and perform some or all or some combination of the following:

- moving a clipping 136 to another area on the same web page 135
- 10 • moving a clipping 136 to another area on a different web page 135
- organizing a set of clippings 136 to form columns
- changing the size of a clipping 136
- changing the shape of a clipping 136
- changing the relative proportions of a clipping 136
- 15 • adding hyperlinks 137 to clippings 136
- establishing a color scheme so that a hyperlink 137 changes color after a user 115 has reviewed it
- changing the frequency with respect to how often information associated with a hyperlink 137 is updated or refreshed
- 20 • establishing a color scheme so that a user 115 can tell at a glance that a hyperlink 137 has been refreshed or updated since the last time the user 115 reviewed the page
- placing clippings 136 so that they lay “on top of” each other so that they can be viewed sequentially.

25 The database 146 includes information regarding a set of users 115, such as their security codes, information to complete registration procedures, a list of web sites that are frequently visited, sets of preferences with respect to manipulation of web pages 135 and other information as is necessary to access web sites 130.

30

In a preferred embodiment, the personal data server 140 also includes a software package 147 that includes software for the aggregation and summarization of personal information, form fill-in and automated log-in. This software package 147 is used to create a "library" of personalized information pertaining to a user that
5 can be accessed so as to automatically respond to requests for registration information or security codes. Such software is known in the art of data manipulation.

Similar to the client device, 110, a preferred embodiment of the personal data server 140 includes a general-purpose computer, such as a laptop or
10 workstation. However, a personal data server 140 can also include (either alone or in conjunction with a laptop or workstation), a hand-held calendar (such as a "Palm Pilot" or other hand-held device), a portable computer, a special purpose computer, a cellular telephone or other telephonic device, a web server acting as the agent for a user, or another device. In alternative embodiments, a personal data server 140 may
15 also include any other device disposed for performing the all or some functions described herein.

The clipping page 150 includes a web page upon which the user 115 can place one or more clippings 136. In a preferred embodiment, a user 115 can use
20 the clipping page 150 as a start page for Internet navigation. Unlike other known start pages, a user 115 can exercise far more flexibility in manipulating the nature, presentation of material and layout of clippings 136 on the clipping page 150. Further details of the clipping page 150 are shown in Figure 3.

25 *Method of Operation*

Figure 2 shows a process flow diagram for a method of using a system for clipping and manipulating elements contained in a web page.

30 A method 200 is performed by the system 100. Although the method 200 is described serially, the steps of the method 200 can be performed by separate

elements in conjunction or in parallel, whether asynchronously, in a pipelined manner, or otherwise. There is no particular requirement that the method 200 be performed in the same order in which this description lists the steps, except where so indicated.

5

At a step 210, the user 115 manipulates a client device 110 to gain access to the communication network 120 and establish a connection with the personal data server 140.

10

At a step 215, the personal data server 140 identifies and authenticates the user 115. In a preferred embodiment, the personal data server 140 can perform this step using a cookie stored at the web client 110. In other preferred embodiments, the personal data server 140 performs this step using a login identifier provided by the user 115.

15

At a step 220, the user 115 selects a web site 130 that they wish to visit and manipulates the client device 110 in a manner so as to inform the personal data server 140. The web site 130 may (but not necessarily) include an index of web pages 135 that are of possible interest to the user 115.

20

At a step 225, the personal data server 140 gets a web page 135 from the web site 130.

25

At a step 230, the personal data server 140 parses the web page 135 and changes the hyperlinks 137. The personal data server 140 then redirects the web page 135 to the client device 110.

30

In a preferred embodiment, the user 115 can access all web pages 135 he desires without having to register or enter security codes; these intermediate steps are performed automatically by the software package 147.

At a step 235, the user 115 accesses the web page manipulation software 146 from the personal data server 140.

At a step 240, the personal data server 140 fragments the web page 135
5 into a set of clippings 136. Any individual clipping 136 can be selected for further manipulation.

In a preferred embodiment, the web page 136 may be broken into a relatively few clippings 136 of uniform size or a relatively large number of clippings
10 136. A user 115 may then focus on a single clipping 136, "zoom in" on it and fragment that single clipping 136 into a set of other small clippings 136. The user 115 may also combine several clippings 136 and fragment the combination of clippings 136 into a set of other smaller clippings 136.

At a step 245, the user 115 selects a clipping 136 to manipulate and
15 moves it to a clipping page 150.

At a step 250, the user 115 manipulates a clipping 136. Possible ways of manipulating a clipping 136 can include one or more or some combination of the
20 following techniques:

- moving a clipping 136 to another area on the clipping page 150
- moving a clipping 136 to a different clipping page 150
- organizing a set of clippings 136 to form columns on a clipping page 150
- 25 • changing the size of a clipping 136
- changing the shape of a clipping 136
- changing the relative proportions of a clipping 136
- adding hyperlinks 137 to clippings 136
- using a filter to selectively highlight or otherwise emphasize or de-emphasize
30 text having a specific attribute (for example, highlighting all text that includes particular words)

- using a filter to select a specific feature of a clipping, such as a multimedia resource, an image, the top five lines or other features, either alone, or in combination.
- enabling the rendering of the clipping page in hand-held devices using WML and XML transformations

If the clipping 136 selected by the user 115 includes a hyperlink 137, other and further variations are possible. The user may use one or more or some combination of the following techniques may be used:

- using a filter to select only the hyperlinks 137 associated with a clipping 136
- establishing a color scheme so that a hyperlink 137 changes color after a user 115 has reviewed it
- changing the frequency with respect to how often information associated with a hyperlink 137 is updated or refreshed
- establishing a color scheme so that a user 115 can tell at a glance that a hyperlink 137 has been refreshed or updated since the last time the user 115 reviewed the page.

In a preferred embodiment, this step is performed in a “what-you-see-is-what you get” type fashion. Steps 235, 240 and 245 can be repeated an indefinite number of times, until the user decides to stop manipulating that particular web page 135.

The method 200 may proceed at step 220 if the user 115 decides to create a second clipping page 150.

At a step 255, the user 115 saves the completed manipulations. This step is optional. If this step occurs, the user can recall his clipping page 150, use it as a start page for navigating the Internet or manipulate it further.

At a step 260, the manipulated web page 130 made by the user 115 is stored in the database 146. This step occurs only if the user 115 has decided to save the manipulated web page.

5 At a step 265, the user 115 decides to stop manipulating web pages 135. The user 115 notifies the personal data server 140 of his decision. At this point the method 200 is at rest until such a time that the user 115 decided to manipulate another web page 135.

10 In a preferred embodiment, the method 200 can be performed repeatedly by a relatively large number of users 115.

Example of a Clipping Page

15 Figure 3 shows an example of a clipping page created from set of clippings.

 The example of a completed clipping page 150 includes, among other things, a site identifier 301, at least one clipping 136, a hyperlink 137 and a return
20 button 306.

 The site identifier 301 includes a graphic or textual representation 302 of the personal data server 140.

 Each clipping 136 includes a banner 303, a feature 304 and a set of
25 manipulation buttons 305.

 The banner 303 identifies the web site 130 where the clipping 136 originated.

30 The feature 304 includes text, graphics, multimedia resource or other selected by a user 115 from the web page 135.

The set of manipulation buttons 305 allow a user 115 to manipulate the clipping 136 after it has been placed on the clipping page 150.

The return button 306 includes the headline "Add a New Web
5 Clipping". The return button 306 can be manipulated by a user 115 to add new clippings 136 to the clipping page 150.

In a preferred embodiment, the user 115 can obtain a new clipping 136 from an index of clippings (not shown). The index of clippings is organized
10 according to an algorithm based on semantic content, or relative position to other clippings. In other preferred embodiments, the user 115 can obtain the clipping 136 directly from the web site 130. In this way, the user 115 can construct a clipping page 150 that is uniquely tailored to his interests.

15 Generality of the Invention

The invention has general applicability to various fields of use, not necessarily related to generation of start pages as described above. For example, these fields of use can include one or more of, or some combination of, the following:

20

- creation of home pages for personal or business use
- creation of public art, so as to appear in a network
- creation of pages that can be shared between users in a work environment, so as continuously update each other or to collaborate on a task
- 25 • enhancement of automated data mining techniques.

Other and further applications of the invention in its most general form, would be clear to those skilled in the art after perusal of this application, and are within the scope and spirit of the invention.

30

Alternative Embodiments

Although preferred embodiments are disclosed herein, many variations are possible which remain within the concept, scope, and spirit of the invention, and
5 these variations would become clear to those skilled in the art after perusal of this application.

Claims

1. A method for computerized clipping and communication of web pages including the steps of
- 5 obtaining web page manipulation software from a personal data server;
parsing said web page and changing the hyperlinks therein;
redirecting said web page to an individual user;
fragmenting said web page into a set of clippings that are presented to said individual user;
- 10 selecting at least one clipping; and
manipulating said clipping in a manner that is responsive to said user's discretion.
2. A method as in claim 1, wherein the step of obtaining said web page manipulation software includes the step of
- 15 obtaining personalized clipping pages that said individual user has already generated.
3. A method as in claim 1, wherein the step of fragmenting said web page into said set of clippings includes the step of
- 20 selecting a relative size or number of clippings included in said set of clippings.
4. A method as in claim 1, wherein the step of fragmenting
- 25 includes the step of
zooming-in on said clipping and refragmenting it.
5. A method as in claim 1, wherein the step of manipulating includes at least one of the steps of
- 30 changing the size or shape of said clipping;
isolating text or graphics from said clipping;

fragmenting said clipping into a second set of clippings; and
selectively highlighting or otherwise emphasizing or de-emphasizing
said clipping in a manner that is responsive to said user's discretion.

5 6. A method as in claim 1, wherein the step of manipulating
includes
 changing the frequency with respect to how often information
associated with said hyperlink is updated; and
 establishing a scheme that identifies whether said hyperlink has been
10 refreshed.

 7. A method as in claim 1, wherein the step of manipulating
includes the step of
 creating said personalized clipping page, including said at least one
15 clipping that said user has manipulated.

 8. A method as in claim 7, including a technique for viewing the
said clippings sequentially (placing them on top of each other) or simultaneously
(placing them next to each other).

20 9. A method as in claim 1, including the step of
 rendering said personalized clipping page in a computerized hand-held
assistant using WML and XML transformations.

25 10. An apparatus for computerized clipping and communication of
web pages, including
 a data server, including a memory and a processor;
 a set of instructions coupled to said memory, wherein said set of
instructions can be executed by said processor, for clipping and manipulating a web
30 page and redirecting said web page to a set of users;

a database coupled to said memory, including a data structure comprising information about a set of users and a set of personalized clipping pages that said users have generated; and

a communication network coupled to said data server.

5

11. An apparatus as in claim 10, wherein said data structure includes personalized information describing the particulars of each user in said set of users.

12. An apparatus as in claim 10, including a means for rendering at
10 least one personalized clipping page included in said set of personalized clipping pages in a hand-held computerized assistant using WML and XML transformations.

13. An apparatus as in claim 10, wherein said set of instructions
includes
15 a subset of instructions to obtain a web page on behalf of a user;
a subset of instructions to parse said web page and alter the hyperlinks included therein;
a subset of instructions to redirect said web page to an individual user;
a subset of instructions to fragment said web page into a set of clippings
20 that are presented to said user;
a subset of instructions to isolate at least one clipping included in said set of clippings in a manner that is responsive to input from said user, and
a subset of instructions to manipulate said clipping in a manner that it responsive to input from said user.

25

14. An apparatus as in claim 13, wherein said subset of instructions to fragment said web page into a set of clippings also includes an instruction to select a relative size and number of clippings to be included in said set of clippings.

15. An apparatus as in claim 13, wherein said subset of instructions to fragment said web page into a set of clippings also includes an instruction to zoom in on a clipping included in said set of clippings and refragment it.

5 16. An apparatus as in claim 13, wherein said subset of instructions to manipulate includes

an instruction to change the size or shape of at least one clipping included in said set of clippings;

10 an instruction to isolate text or graphics included in of at least one clipping included in said set of clippings.

an instruction to fragment at least one clipping included in said set of clippings into a second set of clippings; and

an instruction to highlight or otherwise emphasize or de-emphasize said clipping in a manner that is responsive to said user's discretion.

15

17. An apparatus as in claim 13, wherein said subset of instructions to manipulate includes

an instruction to change the frequency with how often information associated with a hyperlink included in said clipping is updated; and

20 an instruction to establish a scheme that identifies whether said hyperlink has been refreshed.

18. An apparatus as in claim 13, wherein said subset of instructions to manipulate includes an instruction to generate a personalized clipping page,
25 including at least one clipping that said user has manipulated.

19. An apparatus as in claim 10, wherein said set of instructions also includes an instruction to store said at least one clipping for a user in said memory.

30 20. An apparatus as in claim 10, wherein said set of instructions also includes at least one of the following:

an instruction to enable a user included in said set of users to view a two or more clippings included in said set of clippings sequentially; and

an instruction to enable said user to view two or more clippings included in said set of clippings simultaneously.

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21. An apparatus in claim 10, wherein said data structure includes a set of fields including information about each user in said set of users; a set of fields including a security code associated with each said user, a set of fields including preferences associated with each said user; a set of fields including an address in said memory where said web pages created by said user are located; and a set of relations between said sets of fields.

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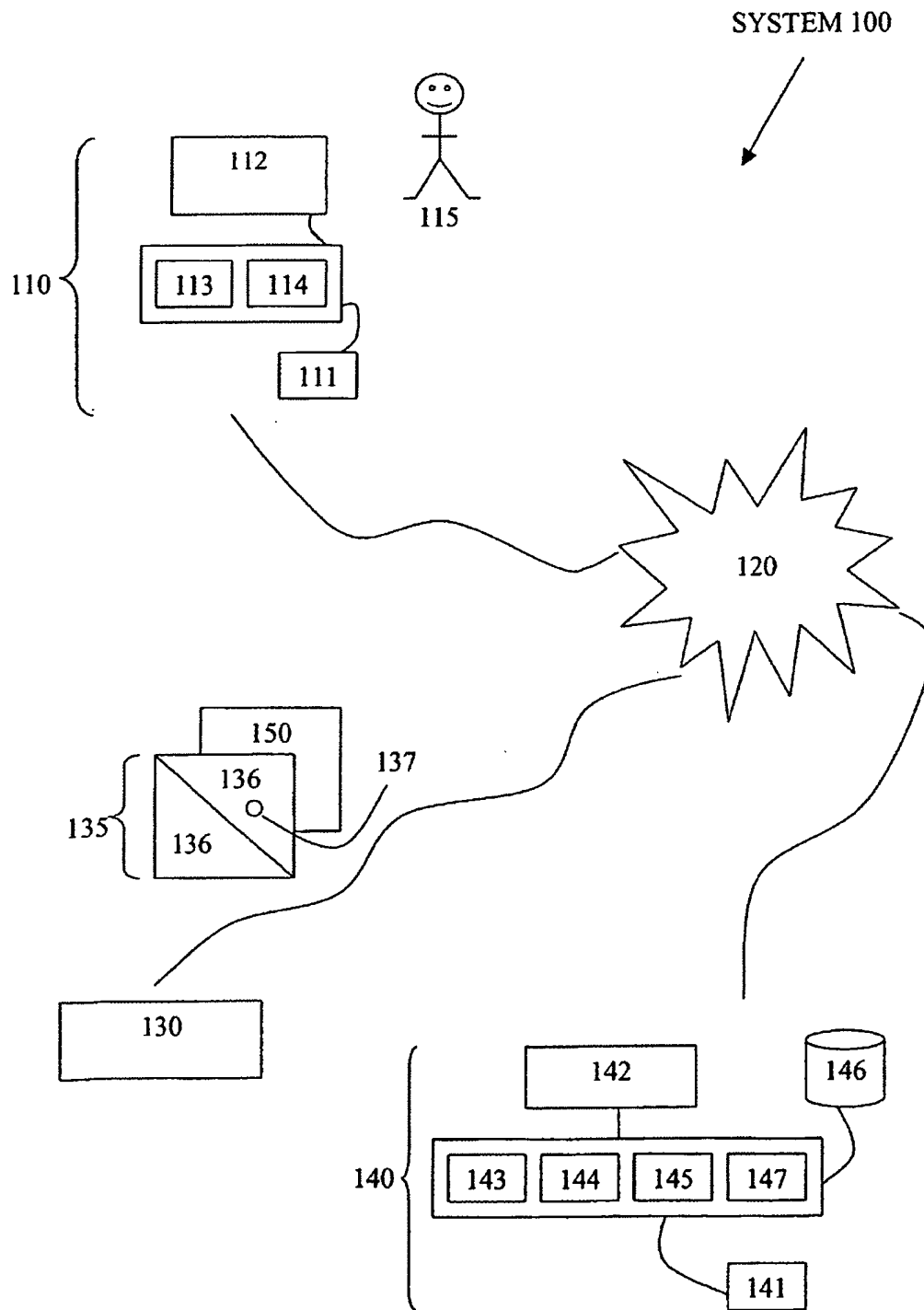


FIG. 1

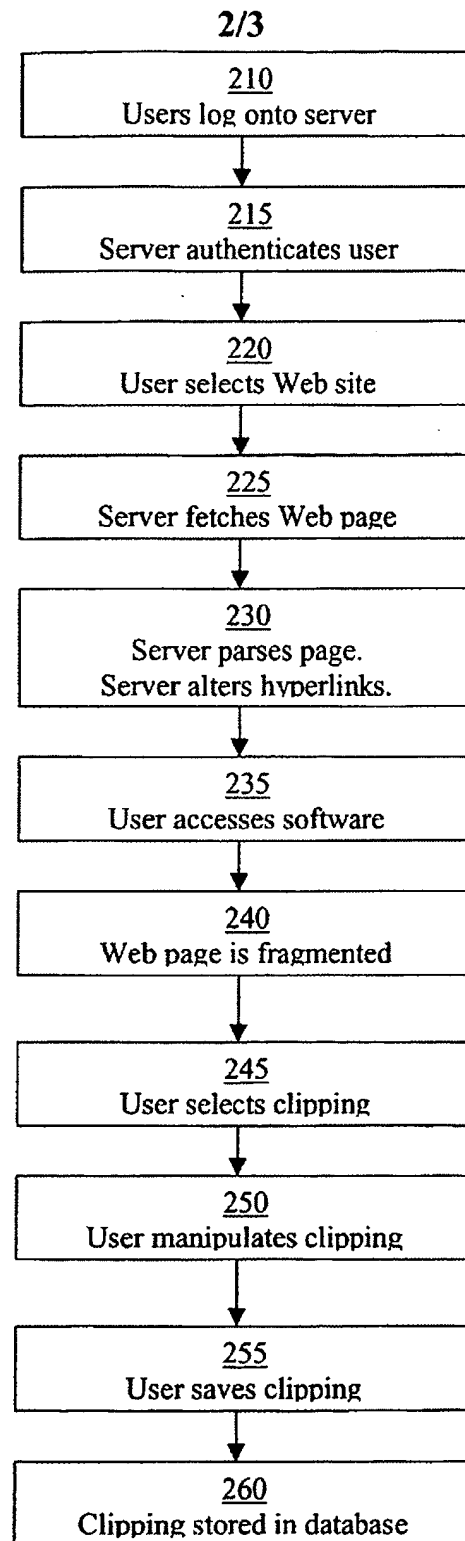


FIG. 2

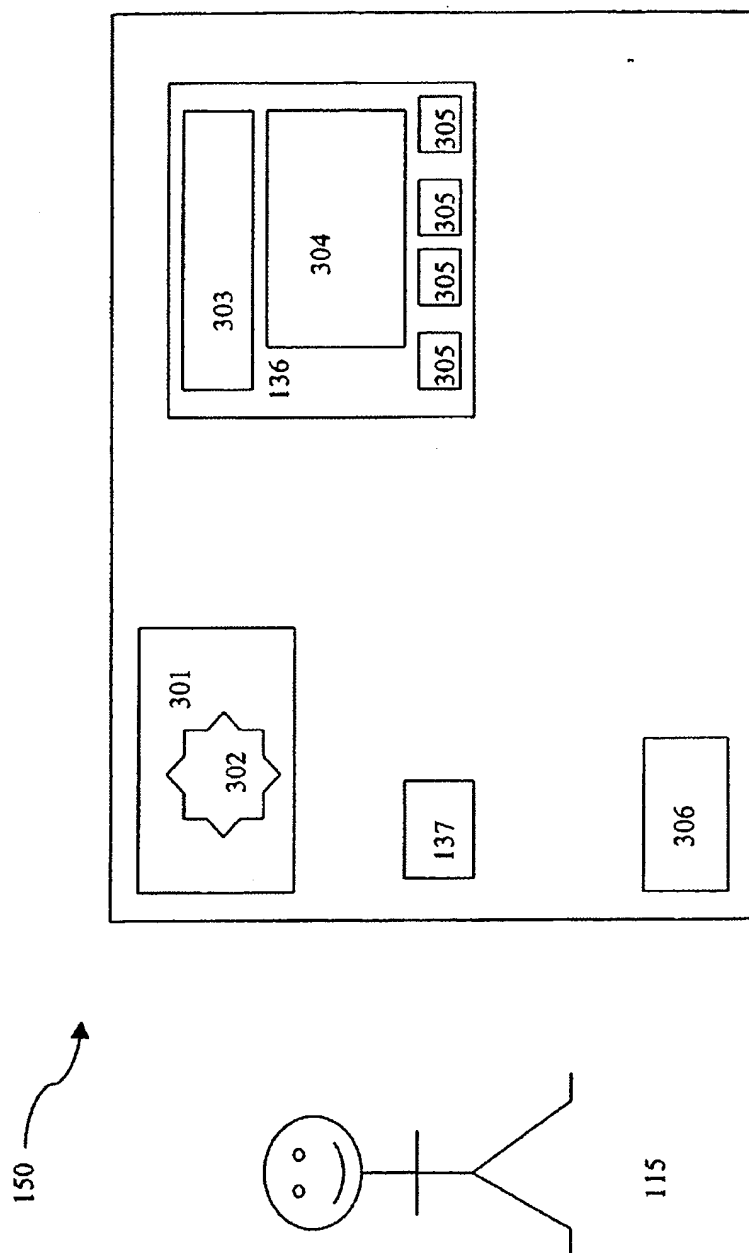


FIG. 3